

**Fishery Data Series No. 06-24**

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# **Results of the 2003 Eastern Aleutian District Tanner Crab Commissioner's-Permit Pot Survey**

**by**

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**and**

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**May 2006**

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**Alaska Department of Fish and Game**

**Divisions of Sport Fish and Commercial Fisheries**



## Symbols and Abbreviations

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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative		fork length	FL
deciliter	dL	Code	AAC	mid-eye-to-fork	MEF
gram	g	all commonly accepted		mid-eye-to-tail-fork	METF
hectare	ha	abbreviations	e.g., Mr., Mrs., AM, PM, etc.	standard length	SL
kilogram	kg			total length	TL
kilometer	km	all commonly accepted			
liter	L	professional titles	e.g., Dr., Ph.D., R.N., etc.	<b>Mathematics, statistics</b>	
meter	m			<i>all standard mathematical</i>	
milliliter	mL	at	@	<i>signs, symbols and</i>	
millimeter	mm	compass directions:		<i>abbreviations</i>	
		east	E	alternate hypothesis	H <sub>A</sub>
		north	N	base of natural logarithm	<i>e</i>
		south	S	catch per unit effort	CPUE
		west	W	coefficient of variation	CV
		copyright	©	common test statistics	(F, t, $\chi^2$ , etc.)
		corporate suffixes:		confidence interval	CI
		Company	Co.	correlation coefficient	
		Corporation	Corp.	(multiple)	R
		Incorporated	Inc.	correlation coefficient	
		Limited	Ltd.	(simple)	r
		District of Columbia	D.C.	covariance	cov
		et alii (and others)	et al.	degree (angular )	°
		et cetera (and so forth)	etc.	degrees of freedom	df
		exempli gratia		expected value	<i>E</i>
		(for example)	e.g.	greater than	>
		Federal Information		greater than or equal to	≥
		Code	FIC	harvest per unit effort	HPUE
		id est (that is)	i.e.	less than	<
		latitude or longitude	lat. or long.	less than or equal to	≤
		monetary symbols		logarithm (natural)	ln
		(U.S.)	\$, ¢	logarithm (base 10)	log
		months (tables and		logarithm (specify base)	log <sub>2</sub> , etc.
		figures): first three		minute (angular)	'
		letters	Jan.,...,Dec	not significant	NS
		registered trademark	®	null hypothesis	H <sub>0</sub>
		trademark	™	percent	%
		United States		probability	P
		(adjective)	U.S.	probability of a type I error	
		United States of		(rejection of the null	
		America (noun)	USA	hypothesis when true)	α
		U.S.C.	United States	probability of a type II error	
			Code	(acceptance of the null	
		U.S. state	use two-letter	hypothesis when false)	β
			abbreviations	second (angular)	"
			(e.g., AK, WA)	standard deviation	SD
				standard error	SE
				variance	
				population	Var
				sample	var
<b>Weights and measures (English)</b>					
cubic feet per second	ft <sup>3</sup> /s				
foot	ft				
gallon	gal				
inch	in				
mile	mi				
nautical mile	nmi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				
<b>Time and temperature</b>					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
degrees kelvin	K				
hour	h				
minute	min				
second	s				
<b>Physics and chemistry</b>					
all atomic symbols					
alternating current	AC				
ampere	A				
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

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CRAB COMMISSIONER'S-PERMIT POT SURVEY**

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## ABSTRACT

From January 15 to February 15 2003, the Alaska Department of Fish and Game (ADF&G) conducted a Tanner crab *Chionoecetes bairdi* stock assessment survey in the Eastern Aleutian District (EAD) of Tanner crab Registration Area J. The 2003 pot survey was conducted in Unalaska Bay, Beaver Inlet and the Akutan/Akun Islands area, offshore areas were not surveyed. Due to budgetary constraints, the survey was conducted utilizing commercial fishermen participating under a commissioner's permit. Permit terms were designed to provide for collection of relative abundance and stock-condition data.

ADF&G conducts trawl surveys triennially in the EAD. Inner bay areas are not typically included in the department's trawl survey, since the steep and rocky bottom topography prohibit the use of trawl gear. However, to address important crab areas in the EAD prior to the next triennial trawl survey, and to survey areas that are untrawlable, the 2003 pot survey was conducted. Participants were authorized to retain and sell all legal male Tanner crab to cover survey expense. ADF&G staff from Dutch Harbor collected biological data on board each participating vessel.

The 2003 survey area was based on areas of abundance from historic pot survey data as well as input from the local crab fishers. The survey areas were divided into 24 stations that included 36 historical pot survey sites within their boundaries. There were 203 pot lifts performed throughout the survey capturing 13,313 Tanner crabs, of which 6,672 legal males (15,138 lbs.) were retained for sale. Maximum soak period of 48 hours was not always adhered to due to poor weather and illness among survey participants. High seas and poor weather prevented all stations from being surveyed due to the small vessel size. There are regulatory size restrictions for vessels in Unalaska Bay (maximum overall length of 58'), however, there are no vessel size restrictions for Beaver Inlet or Akutan/Akun Islands areas. Carapace width (CW) size frequencies showed the largest numbers of recruit (49.9%; CW 139 – 164 mm) and prerecruit I (48.9%; CW 115 – 138 mm) male Tanner crabs came from the Unalaska locale (station A2).

Comparative catch per unit effort (CPUE) data from the historical and 2003 pot surveys show an increase in CPUE in some stations located in Unalaska Bay and Akutan/Akun Island locales, and a decrease in Beaver Inlet stations. Data from the 2003 pot survey will be utilized in conjunction with the 2003 trawl survey to help assess the stock status of Tanner crabs in the EAD.

Key words: Tanner crab, *Chionoecetes bairdi*, pot survey, Aleutian Islands

## INTRODUCTION

### HISTORIC BACKGROUND

In 1971, the Alaska Department of Fish and Game (ADF&G) began developing red king crab *Paralithodes camtschaticus* stock assessment surveys in the Westward Region. With the incidental catch of Tanner crab *Chionoecetes bairdi*, the survey evolved into a multi-species crab assessment survey (Donaldson and Hicks 1980). ADF&G began a Federal Aid Tanner crab research project in 1973 to gather knowledge upon which to base interim harvest levels for the commercial fishery. Since 1973 specific objectives have been to:

- (1) Establish a method of indexing abundance of Tanner crab populations, enabling appropriate management strategies to maintain a sustainable surplus available for harvest.
- (2) Index relative and actual abundance of male and female crab, with particular reference to major fishing districts.
- (3) Determine migration patterns and distribution of various major stocks of Tanner crabs.

The Eastern Aleutian District (EAD) encompasses all waters of Tanner crab Registration Area J between the longitude of Scotch Cap Light and 172° W longitude, and south of 54° 36' N latitude. The EAD is a marginal habitat for Tanner crabs as evidenced by the presence of commercial quantities in only a few bays and inlets (ADF&G 1995). ADF&G conducted the first EAD pot survey in 1979 with subsequent surveys in 1984, 1986 and 1987. These sporadic pot surveys were not used to generate guideline harvest levels (GHL); rather they were used to monitor trends in recruitment and abundance by providing an index of abundance (Table 1). Crab pots are not the preferred survey gear because they do not retain small crabs well and are a passive gear type. Trawl gear was used to survey the EAD beginning in 1990 (Table 2). Trawling allows for faster coverage of the survey area, retains small crabs and is an active gear type (Urban 1992; Worton 2000, 2001). Population estimates can be based on trawl survey data using the *area swept technique* (Urban 1992). The commercial Tanner crab fishery has provided additional data on distribution and relative abundance (Table 3).

The Tanner crab commercial fishery began in the vicinity of Akutan/Akun and Unalaska Islands with relatively low harvest levels (ADF&G 1985b). The 1977/78 season, with 15 participating vessels and 198 landings, produced a record harvest of 2.5 million pounds. Since the 1979/80 season, catches have remained less than 1.0 million pounds (Table 3).

Commercial fishing for Tanner crabs in the EAD was closed after the 1994 season due to low stock abundance. Estimated abundance from the 1994 and 1995 trawl surveys was lower than the estimates made in 1990 and 1991 (Table 2). Data from the 1995 trawl survey indicated an increase in abundance over the 1994 survey; however the abundance of legal males was well below the 1994 estimates (ADF&G 1995). Stock assessment trawl surveys continue to be conducted by ADF&G to monitor the population of Tanner crabs. Trawl surveys in 1994, 1995, 1999 and 2000 indicated that Tanner crab abundance in the EAD was not adequate to support a commercial fishery (Table 2). In order to assess abundance in important crab areas, the 2003 EAD Tanner crab pot survey was conducted. The last EAD trawl survey was conducted in August 2003.

## **METHODS**

### **SURVEY APPROACH/STANDARDIZATION**

The survey area for the 2003 EAD Tanner crab pot survey focused on specific historical pot survey sites selected from the Kodiak research station grid re-defined in 1976 (Figures 1-4). This stratified-random grid pattern was developed by dividing the survey area into strata based on prior knowledge of king/Tanner crab abundance (Donaldson and Hicks 1980). Historical data from trawl and pot surveys (Urban 1992, 1993, 1996a, 1996b; Worton 2000, 2001; Donaldson and Hicks 1980; and ADF&G 1985, 1986, 1987) conducted by ADF&G in the EAD were reviewed for historic site location and legal male Tanner crab catch per unit effort (CPUE). Only historical site locations that documented Tanner crab catches were selected for the 2003 survey. This information was combined to form an informational packet and made available to commercial fishers interested in participating in the survey. Due to department budgetary constraints the survey was conducted using commercial fishermen. Participants were permitted to set 25 pots in each station and authorized to retain and sell all legal male Tanner crabs.



## **STATION IDENTIFICATION**

The 2003 survey stations were grouped into four locales: Unalaska Bay, outer Unalaska Bay, Beaver Inlet and Akutan/Akun Islands. The survey stations were defined areas, each station receiving an alpha-numeric designation from A-D depending on locale. All stations in Unalaska Bay were given 'alpha' designations. Beaver Inlet received 'bravo' designations. Stations outside Unalaska Bay adjacent to the Chelan Bank were given 'charlie' designations. Akutan/Akun Islands area received 'delta' designations (Table 4; Figures 2-4).

## **HISTORICAL POT SURVEY LOCATION**

Previous reports documented historical pot survey sites with Loran C coordinates (Donaldson and Hicks 1980; ADF&G 1985, 1986, 1987). Due to the variation acquired when converting Loran C coordinates to latitude and longitude, historic site locations were plotted from past reports and manually verified on National Oceanic and Atmospheric Administration (NOAA) charts. The latitude/longitude coordinates were then assigned to each appropriate historical site (Table 5). The coordinates were plotted and re-verified with the use of MapInfo 5.5 PC windows based software.

### **Unalaska Bay**

Six survey stations in Dutch Harbor/Unalaska Bay including eight historical sites within Unalaska, Nateekin, Captains, and Iliuliuk Bays, were established (Tables 4 and 5; Figure 2).

### **Outer Unalaska Bay**

Six survey stations outside Unalaska Bay were established. There were no historical sites in 'charlie' designated (C1-C6) stations (Tables 4 and 5; Figure 2). Due to lack of interest, the stations were not assigned.

### **Beaver Inlet**

Eight stations with 15 historical sites located in Beaver Inlet were established in Kisselen, Erskine, Final, Tanaskan, Uniktali, Ugadaga and Agamgik Bays (Tables 4 and 5; Figure 3).

### **Akutan/Akun Islands Area**

Four stations with 13 historical sites within Akutan Harbor and Akutan Bay were established (Tables 4 and 5; Figure 4).

## **STATION ASSIGNMENT**

A news release was distributed on November 15, 2002 from the Dutch Harbor ADF&G office to recruit interest in the 2003 EAD Tanner crab survey from commercial fishers. Interested participants were required to submit letters of intent by 5:00 PM December 16, 2002 specifying the locales they would be willing to survey. ADF&G in Dutch Harbor received eight letters of intent. Stations were randomly drawn on December 20, 2002 and assigned to each participant based on the total number of applicants and locale preference. After assignment of stations three participants dropped out of the survey leaving a total of five participants. The open stations were offered to the remaining five survey participants according to interest specified in their letter of intent though none of these open stations were reassigned. Three participants requested permission to pool their assigned stations in an attempt to consolidate their gear and manpower

using a single vessel. The request was reviewed and approved by ADF&G. The two remaining participants chose to survey independently.

## **VESSELS**

Each vessel and operator was required to be in compliance with all commercial shellfish fishing regulations. Current commercial shellfish regulations limit the overall length of vessels fishing for crabs in Unalaska Bay to a maximum of 58 feet: 5 AAC 35.590 VESSEL LENGTH RESTRICTIONS. Vessel length is unrestricted elsewhere in the EAD. None of the vessels participating in the survey were constrained by this restriction. Prior to participating in the survey, fishers were required to have a U. S. Coast Guard safety inspection and were required to coordinate fishing activity with ADF&G staff who collected biological data on board each vessel.

## **SAMPLING GEAR**

Participants were to set 25 pots per station; of which three pots were required to be set at each historical site (specified GPS coordinate in survey station). All survey pots were required to be set at least one-quarter of a nautical mile apart with pots set at historical sites set in an east to west linear pattern for survey standardization with prior pot surveys. The goal of the pot spacing requirement was to be sure that pots would not compete with one another for available crabs (Hicks and Colgate 1982). Participants were expected to survey all stations assigned to them and were not allowed to reset pots within one-quarter of a nautical mile of a previous pot lift. The participants were required to complete a logbook (Appendix A), documenting their survey activities and catch. ADF&G representatives were required on board each vessel during gear retrieval activity.

Pots used in the survey were required to be rectangular Tanner crab gear with a minimum dimension of 5' x 5' long and a maximum of two tunnel openings. Pots larger than 10' x 10' long were not permitted. Tunnel eye openings were restricted to no more than five inches in height. In an attempt to retain smaller crabs the mesh size was required to be no larger than five inches stretched, and escape rings were closed to no more than three and one half inches in diameter (Appendix B).

## **FISHING PROCEDURES**

Pots were baited with containers filled with chopped herring *Clupea harengus* and hanging bait consisting of Pacific cod *Gadus macrocephalus*. Pot soak time was set for a minimum of 24 and a maximum of 48 hours. As the pots were pulled every crab was examined by the survey participants to determine species, sex, and size. Sublegal male and female Tanner crabs were counted and sex was noted for logbook documentation and immediately released. All legal males were retained.

## **SAMPLE POTS**

ADF&G staff from Dutch Harbor were present on each survey vessel to sample the catch, observe fishing practices, and verify pot locations. ADF&G staff sampled one out of every five pots, all catch from sampled pots was documented including bycatch. All Tanner crabs in sample pots had carapace width (CW) measured and were examined for shell-age and condition (Table 6). Male Tanner crabs were then returned to the vessel crew for determining whether legal for retention or sublegal to be released.

Female Tanner crabs in sample pots were examined for shell-age, clutch fullness and egg condition, measured and released by the sampler on board the vessel (Table 7). All groundfish caught in sample pots were measured and either released or retained for bait by the crew depending on the species. All information was recorded on a tape recorder by the sampler and later transcribed to the appropriate data forms.

The majority of the survey occurred during day-trips in the Unalaska Bay locale; survey vessels returned to the Dutch Harbor small boat harbor after all the pots had been pulled, sampled and reset. The vessel assigned stations in Akutan and Beaver Inlet made one 12-day trip to those locations.

## **RESULTS**

The survey participants were not regular fishers in crab fisheries. Their vessels had to be configured for setting and hauling pots. Most of the participants needed to find or borrow pots of specific dimensions as specified by the commissioner's permit (Appendix B). Because of these logistical delays some vessels did not start at the opening date of the survey. During the course of the survey adverse weather, rough seas and illness prevented the adherence to maximum pot soak limit of 48 hours.

### **TOTAL TANNER CRAB CATCH**

A total of 13,313 Tanner crabs were captured from 203 pot lifts during the survey with an overall Tanner crab CPUE of 66. Of this total, 6,672 legal males were retained for a legal male mean CPUE of 33. A total of 6,255 sublegal male crabs were caught for a sublegal mean CPUE of 31 and 386 females were caught for a female mean CPUE of two. The majority of Tanner crabs were caught in Nateekin Bay (station A2), and Akutan Harbor (station D3). Beaver Inlet produced only six legal Tanner crabs (Table 8).

### **CATCH SAMPLE DATA**

A total of 2,346 (17.6% of overall catch) Tanner crabs were measured and examined for shell-age and condition. A total of 2,304 male Tanner crabs were sampled, of which 1,219 were legal-size, and 1,085 were sublegal. Male Tanner crab size-frequency consisted of 37.2% prerecruit I (CW 115–138 mm), 50.1% recruit (CW 139–164 mm) and 1.1% postrecruit (CW >164 mm). The remaining 11.6% were prerecruit II or smaller (CW <115 mm).

Of the crabs sampled eight were soft shell, 896 were new shell, 1,394 were old shell, and 48 were very old shell (Table 6). Based on carapace width (CW) the greatest number of recruit (49.9%; CW 139–164 mm) and prerecruit I (48.9%; CW 115–138 mm) Tanner crabs sampled came from the Unalaska Bay station A2 (Table 8).

### **OUTER UNALASKA BAY**

There were seven stations (C1-C6) outside Unalaska Bay (Figure 2). These stations were not surveyed due to lack of interest from participants.

### **UNALASKA BAY**

Five participants received stations in Unalaska Bay. Three participants pooled their resources and used a single vessel to survey stations A2, A4, and A5 (Figure 2). Survey efforts began January 15, 2003 with pots set in stations A2 and A5. Two pots were lost at historical site 88. Station A6 was not surveyed due to lack of interest from participants.

Two participants surveyed independently; one surveying station A1, the other participant surveyed A3. The participants in these areas did not follow the terms of the commissioner's permit as some pots were reset in areas where Tanner crabs were caught in high abundance without regard for the pot spacing specified in the commissioner's permit. One pot was lost in station A1 at historical site 99. Another pot was lost in station A3. Exact catches at historical sites in these stations could not be tabulated due to insufficient information from logbooks submitted after the survey (Appendix A).

Participants surveying stations A3 and A5 did not adhere to specified station boundaries and set some pots in neighboring stations not assigned to them. One pot from A5 was placed in A3, six pots from A3 were placed in A2. There was one pot from A1 placed in A2, again deviating from permit terms specifying 25 pot lifts per station (Table 8; Figure 2).

A total of 101 pot lifts in the Unalaska locale caught 10,037 Tanner crabs for an overall mean CPUE of 99. A total of 5,264 legal Tanner crabs were caught in Unalaska Bay, setting the legal male mean CPUE of 52. There were 4,516 sublegal crabs caught and released, setting the sublegal mean CPUE of 45. There were 257 female Tanner crabs caught setting the female mean CPUE of three (Table 8). Incomplete logbooks made it difficult to determine all pot locations, exact soak periods and depths. The highest legal male CPUE of the historic sites fished was recorded at historical site 98 with a CPUE of 174 (Table 1).

The majority of legal male catch occurred in station A2, accounting for 71.7% of the legal male catch from Unalaska locale. Stations A1, A3, and A4, accounted for the remaining 28.3% of legal males. There were no legal male Tanner crabs caught in station A5 (Table 8).

A total of 1,662 Tanner crabs were sampled in the Unalaska locale. The sample consisted of 1,649 male and 13 female Tanner crabs. The male sample was 42.8% prerecruit I (CW 115–138 mm), 56.7% recruit (CW 139–164 mm) and 0.5% postrecruit (CW >164 mm) sized crabs. Male Tanner crabs sampled consisted of 31.5% new shell, 66.7% old shell and 1.8% very old shell (Figure 5). Female shell-age consisted of 15.4% new shell, 76.9% old shell and 7.7% very old shell. Average female clutch fullness in station A2 was 72% and zero in stations A1 and A3. There were no females sampled in stations A4 or A5 (Table 7).

## **BEAVER INLET**

Three participants were assigned stations in Beaver Inlet and combined their efforts on a single vessel. Fishing began January 19, 2003. Since the catch was comprised of almost all sublegal Tanner crabs, the participants requested that they be allowed to forego further surveying in this area after completing stations B1 and B2. They were informed by ADF&G that their commissioner's permit would be revoked if they did not complete their assigned stations. They continued by setting pots only in the historical site locations. The participants in Beaver Inlet were not assigned station B3 with two historical sites. The ADF&G biologist on board the vessel asked the vessel operator to survey the historical sites in B3. The participant added these historical sites to their efforts. Due to poor weather conditions and vessel size the assigned survey station B8, Southeast of Egg Island within Sedanka Pass outside of Beaver Inlet was not surveyed. Station B7 outside of Beaver Inlet, northwest of Egg Island within the entrance to Unalga Pass, was not an assigned station due to lack of interest from participants (Table 4; Figure 3).

Of the 63 pots pulled, 54 were 6' x 6' long rectangular pots, the remaining were 7' x 7' long rectangular pots. The participants had a total of 18 pots and used them in each area. All pots were configured as per the terms of the commissioner's permit to allow for the retention of small crabs. Initially poor weather conditions prevented the adherence to maximum pot soak periods of 48 hours. The participants made a trip to Akutan/Akun Islands area to set survey pots before returning to continue stations in Beaver Inlet. Average soak periods in Beaver Inlet ranged from 28 to 36 hours with depth ranging from 20 to 166 fathoms. With no legal crab being caught the participants interest in the area began to diminish; pots were pulled promptly after the minimum 24-hour soak time. The logbooks for this survey locale had some pages lost in their laptop computer that was damaged during the trip.

In the Beaver Inlet locale, a total of 1,070 Tanner crabs were caught for an overall mean CPUE of 17. Only six legal Tanner crabs were caught comprising less than 0.6% of the catch in Beaver Inlet, setting the legal crab mean CPUE of less than one (Table 8). Sublegals comprised 87.4% of the catch with 935 crabs being caught and released, setting the sublegal mean CPUE of 15. There were 129 female Tanner crabs caught which comprised 12.1% of the catch with a mean CPUE of two. The legal male catch occurred in station B4. Only sublegals and females were caught in the other stations. The highest legal male CPUE of two was recorded at historical site 248 (Table 1).

A total of 254 Tanner crabs were sampled in the Beaver Inlet locale. The sample was comprised of 225 male Tanner crabs and 29 females. The male sample was 100% prerecruit (CW <138 mm) sized crabs. Male Tanner crabs sampled consisted of 3.8% soft shell, 83.7% new shell and 12.5% old shell (Figure 5). Average female clutch fullness for Beaver Inlet stations was 34% in station B1, 20% in B2, zero in B3 and 17% in station B4 (Table 7). No females were sampled in station B5.

## **AKUTAN/AKUN ISLANDS AREA**

Three participants were assigned stations in Akutan/Akun Island locale (Figure 4), and combined their efforts on a single vessel. Fishing began in the area on January 24, 2003 with participants setting pots in D3 before returning to Beaver Inlet stations. Fishing resumed in Akutan Harbor on January 27, 2003. Station D3 was completed, though poor weather conditions limited the access to other stations to be surveyed. It took several attempts to reach pots that had soak-periods of 120 hours located in D2 historical sites. Station D1 was not surveyed due to poor weather conditions and vessel size. The participants pulled all their pots and returned to Dutch Harbor on January 30, 2003.

Of the 39 pots pulled 29 were 6'x 6' rectangular pots, the remaining were 7'x 7' rectangular pots. All pots were configured to allow for the retention of small crabs.

In the Akutan/Akun Islands locale, one pot was lost in D3, average soak time ranged from 24 to 120 hours at an average depth of 34 fathoms. A total of 2,206 Tanner crabs were caught for an overall mean CPUE of 57. There were 1,402 legal Tanner crabs caught comprising 63.6% of the catch in the Akutan/Akun stations surveyed, for a legal crab mean CPUE of 36. There were 804 sublegals accounting for 36.4% of the catch, for a sublegal mean CPUE of 21. There were no female Tanner crabs caught. The majority of legal Tanner crabs were caught in D3 (Table 8; Figure 4). Of the historic sites fished the highest legal male CPUE was recorded at historical sites 45 and 49 with a CPUE of 93 and 27 respectively (Table 1).

A total of 430 Tanner crabs were sampled. The sample consisted of 430 male Tanner crabs. The male sample was 32.7% prerecruit I (CW 115 – 138 mm), 63.1% recruit (CW 139 – 164 mm) and 4.2% postrecruit (CW >164 mm) sized crabs. Male Tanner crabs sampled consisted of 44.5% new shell, 54.3% old shell and 1.2% very old shell (Figure 5). No female Tanner crabs were sampled.

## DISCUSSION

The EAD Tanner crab commercial fishery was closed in 1995 due to low stock abundance estimate from the 1994 trawl survey. Trawl surveys in 1995, 1999 and 2000 indicated that the stock had not increased to the level seen in the early 1990s. Prior to the 2003 pot survey no stock assessment survey has been conducted since 2000.

The most recent commercial Tanner crab fishery in the EAD occurred in 1994 harvesting 71,962 Tanner crabs; with 35.7% of the catch from Akutan, 34.2% from Unalaska Bay, and 30.1% from Beaver Inlet, with 6,323 pot lifts for an overall legal crab mean CPUE of 11 (Table 3). An analysis of statistical reporting areas compared historical commercial Tanner crab fisheries harvest and the 2003 pot survey catch. Previous catch data from the commercial Tanner crab fishery (1990-1994) can not be specified by survey station as crab observer coverage for commercial catcher vessels was not instituted in this area (Boyle and Schwenzfeier 2002). In the commercial Tanner crab fishery from 1990-1994, 48.9% of the legal Tanner crabs harvested came from Unalaska Bay, 28.7% from Beaver Inlet, and 22.4% from the Akutan/Akun Islands area (Figure 6). In the 2003 pot survey 78.8% came from Unalaska Bay, less than 0.1% from Beaver Inlet, and 21.1% from Akutan/Akun area.

Based on an average exvessel price of \$2.15 per pound, the 1994 EAD Tanner crab fishery was worth \$358,100. During the 2003 EAD pot survey 6,673 Tanner crabs were retained and sold for an exvessel price of \$2.50 per pound, producing \$37,800 for the participants.

Legal male CPUE data from the historic sites in previous pot surveys was compared with historic sites surveyed in 2003 showing an increase in legal male CPUE in Unalaska Bay at historic sites 97, 98, 99 and 100 (Table 1). Akutan/Akun Islands showed an increase in legal male CPUE at historic sites 45 and 49. Legal male CPUE was reduced in all Beaver Inlet stations. The offshore stations of the survey were not surveyed due to small vessel size and lack of participant interest. The majority of the Tanner crabs harvest in bays appeared to occur in a few localized pockets that could be impacted by excessive commercial harvest. High exploitation rates on offshore populations may be compensated from mature Tanner crabs from bay areas. However, the movement of Tanner crabs to bay areas from offshore crab populations is potentially more limiting (Donaldson 1983). If the EAD Tanner crab fishery is reopened, the localized nature of the population should be considered when setting harvest levels.

The catch of Tanner crabs during the 2003 EAD survey increased from prior pot surveys, but was limited in distribution because all stations were not surveyed. Lost pots were counted toward the authorized 25 pots per survey station; participants were not allowed to reset another pot in its place.

An analysis of CPUE for pots that were reset in areas of high abundance, thereby violating the commissioner's permit guideline on minimum pot spacing of one-quarter of a nautical mile, was conducted using MapInfo 5.5 plots. An average of 46% of the pots were removed from the analysis of each survey area due to the pot spacing violations. Changes in the reported overall

CPUE averaged 19% for the 2003 survey areas. In Unalaska Bay stations the overall CPUE was reduced from 99 to 82. Beaver Inlet overall CPUE increased from 17 to 21. Overall CPUE for the Akutan/Akun Island stations was reduced from 57 to 51. These changes in catch data are not represented in this report, rather the analysis was conducted separately to ascertain the level of change that may occur if proper pot spacing was maintained. Survey station boundary lines that were not observed by the participants, causing pots to be set over the line in a bordering station, resulted in the catch from those pots being documented in the stations they were set in (Figures 1 and 2; Table 6).

Previous pot surveys used chopped frozen herring placed in perforated containers and did not use hanging bait. Whether this affects catch rates or not is unclear. Historical pot surveys used 7' x 7' long rectangular crab pots covered with three and one-half inch webbing. The 2003 survey allowed webbing up to five inches. Historically pot surveys were conducted in July and August, whereas the 2003 survey was conducted in January and February corresponding to the previous commercial Tanner crab fishery (historically conducted January–June) in the survey area which has remained closed since 1994. Using commercial fishermen for pot surveys lowers the costs incurred by ADF&G, but considerable time is invested by staff in organizing survey design, permitting, and sampling (Granath 2003). The success of the survey is dependent on the efforts of the survey participants and their ability and willingness to comply with terms of the commissioner's permit.

Not all of the objectives of the 2003 Tanner crab EAD pot survey were met since all survey stations were not surveyed and other stations surveyed were not surveyed thoroughly. Pot survey results did however provide information on portions of the Tanner crab population that are not surveyed by trawl gear. In addition, the pot survey results allow for some basic comparisons to be made between current and historical relative abundance.

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## **TABLES AND FIGURES**

**Table 1.-**Eastern Aleutian Tanner crab pot survey legal male catch per unit effort (CPUE) by historic site and survey year.

Historic Site <sup>a</sup>	CPUE <sup>b</sup> by Survey Year				
	1979	1984	1986	1987	2003
Akutan/Akun Islands					
45	0	0	0	0	93
49	1	2	0	1	27
52	10	0	0	0	1
57	0	0	0	0	0
59	2	0	1	2	0
62	2	0	0	0	0
Unalaska Bay					
88	0	0	0	0	0 <sup>c</sup>
92	0	0	0	0	0
97	0	1	5	6	18
98	0	0	2	3	174
99	0	0	5	3	11 <sup>c</sup>
100	1	0	1	2	46
Beaver Inlet					
230	0	0	0	2	0
231	4	1	0	5	0
232	1	5	0	1	0
234	1	2	0	26	0
235	1	1	0	2	0
236	0	2	0	0	0
238	4	2	0	3	0
239	0	0	0	0	0
242	2	0	0	0	0
243	4	0	0	0	0
244	0	0	0	0	0
248	3	2	0	5	2
249	0	0	0	0	0
251	4	1	0	0	0
253	0	0	0	0	0

<sup>a</sup> Historic sites are composed of three pots with ¼ mile spacing.

<sup>b</sup> CPUE data is for legal male Tanner crabs only.

<sup>c</sup> Two pots lost in survey station A5 at historic site 88, and one lost in station A1 at historic site 99.

**Table 2.-**Legal male Tanner crabs caught during 1990, 1991, 1994, 1995, 1999, 2000 and 2003 Eastern Aleutian District trawl surveys with population estimates and corresponding historical pot survey sites.

Historic Sites Surveyed In 2003 Pot Survey		Corresponding Trawl Survey Station by Year <sup>a</sup>								Population Estimates by Survey Locale <sup>b</sup>						
Akutan/Akun Islands	Trawl Station	1990	1991	1994	1995	1999	2000	2003	1990	1991	1994	1995	1999	2000	2003	
41 <sup>c</sup> , 47 <sup>c</sup>	AKL	14	20	0	5	174	43	18								
53 <sup>c</sup> , 52, 58 <sup>c</sup>	AKG	2	8	4	1	21	38	9								
45	AKA	0	0	0	5	1	0	0								
52, 57, 59	AKC	0	0	0	0	0	0	0								
46 <sup>c</sup> , 49	AKD	0	0	0	4	28	24	71	3,410,505	3,428,606	68,518	188,266	2,993,069	786,151	1,569,053	
Beaver Inlet 230, 231	BIB	1	2	4	1	2	0	0								
237 <sup>c</sup>	BID	0	0	2	0	0	0	0								
249	BIG	0	0	2	2	0	0	0								
248	BIK	4	1	19	1	0	0	0								
253	BIN	0	0	0	0	0	0	0	2,423,588	1,325,701	237,751	1,321,706	336,319	518,871	467,278	
Unalaska Bay																
88	UND	0	0	3	1	6	2	0								
92	UNE	2	0	0	1	20	1	0								
97, 100	UNC	9	8	0	0	111	32	195								
89 <sup>c</sup>	UNF	1	2	0	0	0	0	0								
91 <sup>c</sup> , 87 <sup>c</sup>	UNJ	0	0	1	0	39	0	3								
85 <sup>c</sup>	UNG	0	0	0	0	0	0	0								
80 <sup>c</sup>	KAA	0	0	0	0	0	0	0	2,345,224	2,283,487	41,685	66,606	1,398,347	1,867,875	898,662	
35, 40, 37	ANA	0	0	0	0	0	0	0								
36	AND	0	0	0	0	0	0	0	3,156	1,060	0	0	13,823	18,307	6,377	
Total		33	41	35	21	402	140	296								

<sup>a</sup> The number of legal male Tanner crabs caught during trawl surveys.

<sup>b</sup> The population estimates by trawl survey locale are based on total Tanner crabs caught (male and female).

<sup>c</sup> Historic survey site not surveyed during the 2003 Eastern Aleutian District commissioner's permit pot survey.

**Table 3.-**Historical Eastern Aleutian District Tanner crab fishery data, 1973/74-2003 seasons.

Season	Vessels	Landings	Number of		Pots lifted	Weight <sup>b</sup>	Average CPUE <sup>c</sup>	Deadloss <sup>b</sup>
			Crabs	Harvest <sup>a, b</sup>				
1973/74	6	14	210,539	498,836	NA	2.4	60	NA
1974/75	CONFIDENTIAL							NA
1975/76	8	13	219,166	534,295	4,646	2.4	47	NA
1976/77	12	35	544,755	1,239,569	9,640	2.3	57	NA
1977/78	15	198	1,104,631	2,494,631	29,855	2.3	37	NA
1978/79	20	174	542,081	1,280,115	18,618	2.4	20	NA
1979/80	18	107	352,819	886,487	18,040	2.4	20	0
1981	29	119	264,238	654,514	21,771	2.4	12	0
1982	31	138	332,260	739,694	30,109	2.2	11	0
1983	23	107	250,774	547,830	22,168	2.1	11	0
1984	16	91	104,761	239,585	11,069	2.3	9	0
1985	6	56	71,918	165,529	5,620	2.3	13	0
1986	9	37	73,187	167,339	10,244	2.3	7	0
1987	7	63	71,338	160,292	5,294	2.2	13	0
1988	19	130	129,468	309,918	11,011	2.4	12	0
1989	12	109	144,746	326,396	14,685	2.2	10	0
1990	10	75	73,269	171,785	6,858	2.3	11	0
1991	5	27	21,511	50,038	1,849	2.3	12	0
1992	4	29	42,096	98,703	2,963	2.3	14	0
1993	7	34	51,441	118,609	3,530	2.3	15	0
1994	8	120	71,962	166,545	6,323	2.3	11	40
1995-2002				Fishery	Closed			
2003 <sup>d</sup>	3	10	6,672	15,138	203	2.3	33	9

NA: Not available.

a Deadloss included beginning 1980.

b In pounds.

c Number of legal crabs per pot lift.

d January/February Eastern Aleutian District pot survey (fish ticket harvest code 15).

**Table 4.-**Coordinates of station corners for the 2003 Eastern Aleutian District Tanner crab pot survey.

Station	W. Longitude			N. Latitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
A1	53	52	51	166	34	39
				166	33	48
A1	53	52	38	166	32	18
	53	52	49	166	32	8
A1		Unalaska Island			Unalaska Island	
A1		Unalaska Island			Unalaska Island	
A2	53	54	17		Unalaska Island	
A2	53	54	17		Unalaska Island	
A2		Unalaska Island			Unalaska Island	
A2	53	52	51	166	34	39
	53	52	42	166	33	48
A3	53	57	0	166	35	19
A3	53	55	28	166	30	33
A3	53	54	17		Unalaska Island	
A3	53	54	17		Unalaska Island	
A4	53	55	28	166	30	33
A4	53	57	24	166	26	19
A4		Unalaska Island			Unalaska Island	
A4		Unalaska Island			Unalaska Island	
A5	53	57	0	166	35	19
A5	53	57	24	166	26	19
A5	53	55	28	166	30	33
A6	54	0	50	166	40	20
A6	54	0	32	166	22	30
A6	53	57	0	166	35	19
A6	53	57	24	166	26	19
B1		Unalaska Island			Unalaska Island	
B1		Unalaska Island		166	29	50
B1		Unalaska Island			Unalaska Island	
B1		Unalaska Island		166	29	50
B2		Unalaska Island		166	29	50
B2		Unalaska Island		166	24	50
B2		Unalaska Island		166	29	50
B2		Unalaska Island		166	24	50
B3		Unalaska Island		166	24	50
B3	53	49	57	166	23	18
B3		Unalaska Island		166	24	50
B3	53	48	2	166	18	3
B4	53	52	12	166	19	6
B4	53	49	23	166	12	5
B4	53	49	57	166	23	18
B4	53	48	2	166	18	3
B5	53	56	0	166	12	21
B5	53	53	3	166	9	31
B5	53	52	12	166	19	6
B5	53	50	27	166	15	17
B6	53	53	3	166	9	31
B6	53	51	24	166	7	9
B6	53	50	27	166	15	17
B6	53	49	23	166	13	5

-continued-

**Table 4.**-(Page 2 of 2).

Station	W. Longitude			N. Latitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
B7	53	56	0	166	12	21
B7	53	56	0	3-mile state-water boundary		
B7	53	51	24	166	7	9
B7	53	51	24	3-mile state-water boundary		
B8	53	51	24	166	7	9
B8	53	51	24	3-mile state-water boundary		
B8	53	47	38	Unalaska Island		
B8	53	47	38	3-mile state-water boundary		
C1	3-mile state-water boundary			166	40	20
C1	3-mile state-water boundary			166	33	34
C1	54	0	0	166	40	20
C1	54	0	0	166	33	34
C2	3-mile state-water boundary			166	33	34
C2	3-mile state-water boundary			166	27	34
C2	54	0	0	166	33	34
C2	54	0	0	166	27	34
C3	3-mile state-water boundary			166	27	34
C3	3-mile state-water boundary			166	22	24
C3	54	0	0	166	27	34
C3	54	0	0	166	22	30
C4	3-mile state-water boundary			166	22	24
C4	3-mile state-water boundary			166	16	36
C4	54	0	0	166	22	24
C4	54	0	0	166	16	36
C5	54	0	0	166	22	30
C5	54	0	0	166	16	36
C5	Unalaska Island			Unalaska Island		
C5	Unalaska Island			166	16	36
C6	3-mile state-water boundary			166	16	36
C6	3-mile state-water boundary			166	10	22
C6	Unalaska Island			166	16	36
C6	53	56	0	166	10	22
D1	54	17	31	3-mile state-water boundary		
D1	54	17	31	Akun Island		
D1	54	14	0	3-mile state-water boundary		
D1	54	14	0	Akun Island		
D2	Akutan Island			165	53	42
D2	54	14	0.0	Akun Island		
D2	54	10	56	Akutan Island		
D2	54	10	56	Akun Island		
D3	54	10	56	Akutan Island		
D3	54	10	56	Akun Island		
D3	54	7	44	165	40	2
D3	54	8	21	165	38	19

**Table 5.-**Historical Eastern Aleutian Tanner crab pot survey sites (GPS coordinates).

Historic Site <sup>a</sup>	West Longitude			North Latitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
34	54	14	48	165	26	24
35	54	13	15	165	27	42
36	54	17	42	165	27	06
37	54	14	48	165	29	06
40	54	14	48	165	31	36
45	54	8	48	165	41	54
47	54	16	42	165	42	30
49	54	10	48	165	42	24
52	54	12	42	165	44	12
57	54	10	48	165	46	36
58	54	14	54	165	44	36
59	54	12	42	165	47	36
62	54	12	42	165	49	58
85	53	59	08	166	27	50
88	53	57	15	166	28	55
89	53	59	08	166	30	34
92	53	57	15	166	31	44
97	53	56	55	166	36	10
98	53	52	54	166	36	53
99	53	50	45	166	35	17
100	53	54	59	166	36	25
230	53	44	44	166	32	42
231	53	44	20	166	36	00
232	53	43	15	166	33	45
234	53	42	46	166	31	45
235	53	47	15	166	30	45
236	53	44	00	166	29	00
238	53	47	15	166	27	15
239	53	49	30	166	25	00
242	53	49	00	166	22	30
243	53	51	00	166	21	00
244	53	52	00	166	20	30
248	53	51	00	166	17	00
249	53	49	00	166	15	00
251	53	51	00	166	15	00
253	53	51	00	166	12	00

<sup>a</sup>

Site locations are based on center of historical site.

**Table 6.-**Carapace width frequency and shell-age composition of Tanner crabs sampled during the 2003 Eastern Aleutian District pot survey.

Carapace width <sup>a</sup> (mm)	Sublegals				Legals			Females		
	New Pliable	New	Old	Very Old	New	Old	Very Old	New	Old	Very Old
65	0	0	0	0	0	0	0	1	0	0
70	0	0	0	0	0	0	0	1	0	0
75	0	1	0	0	0	0	0	2	0	0
80	0	5	1	0	0	0	0	4	2	0
85	1	10	0	0	0	0	0	0	1	1
90	1	20	2	0	0	0	0	2	4	0
95	1	28	5	0	0	0	0	3	1	0
100	1	42	7	0	0	0	0	3	7	0
105	4	37	14	1	0	0	0	0	4	1
110	0	51	45	1	0	0	0	0	3	1
115	0	41	31	1	0	0	0	0	1	0
120	0	42	60	2	0	0	0	0	0	0
125	0	55	90	6	0	0	0	0	0	0
130	0	76	131	3	0	0	0	0	0	0
135	0	93	171	5	0	0	0	0	0	0
140	0	0	0	0	108	265	12	0	0	0
145	0	0	0	0	112	205	6	0	0	0
150	0	0	0	0	74	165	3	0	0	0
155	0	0	0	0	48	113	4	0	0	0
160	0	0	0	0	22	38	1	0	0	0
165	0	0	0	0	12	19	0	0	0	0
170	0	0	0	0	3	8	0	0	0	0
175	0	0	0	0	0	1	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0
Total	8	501	557	19	379	814	26	16	23	3

<sup>a</sup> Midpoint of 5 mm carapace width size class.



**Table 7.-**Carapace width, shell-age, egg condition, egg development and clutch fullness of female Tanner crabs sampled during the 2003 Eastern Aleutian District pot survey.

StationID <sup>a,b</sup>	Carapace		Egg		Ovigerity <sup>e</sup>
	Width (mm)	Shell-age	Condition <sup>c</sup>	Egg Development <sup>d</sup>	
A1	90	2	4	0	0
A1	98	2	5	0	0
A1	100	1	5	0	0
A1	102	1	5	0	0
A1	104	2	5	0	0
A1	111	2	4	0	0
A1	112	2	4	0	0
A2	102	2	1	1	60
A2	103	2	1	1	80
A2	106	2	1	1	60
A2	109	2	1	1	80
A2	114	2	1	1	80
A3	106	3	5	0	0
B1	80	1	1	1	20
B1	81	1	1	1	20
B1	82	2	1	1	40
B1	84	2	1	1	40
B1	86	3	2	1	20
B1	88	2	2	1	20
B1	89	2	1	1	20
B1	90	2	1	1	20
B1	93	1	2	1	20
B1	93	1	1	1	20
B1	93	2	1	1	60
B1	98	2	1	1	60
B1	99	2	1	1	60
B1	102	2	1	1	40
B1	105	2	1	1	60
B1	111	3	2	1	20
B2	98	2	1	1	20
B4	66	1	4	0	0
B4	71	1	4	0	0
B4	75	1	4	0	0
B4	77	1	4	0	0
B4	78	1	4	0	0
B4	78	1	4	0	0
B4	81	2	1	1	20
B4	90	1	1	1	20
B4	90	1	1	1	40
B4	95	1	1	1	40
B4	99	2	1	1	60
B4	100	1	1	1	20

<sup>a</sup> No female Tanner crabs sampled from Akutan/Akun Islands area.

<sup>b</sup> Each record represents one female Tanner crab n = 42.

<sup>c</sup> Egg condition, '1' = no dead eggs, '2' = <20% dead eggs, '4' = barren/clean setae, '5' = barren/matted setae.

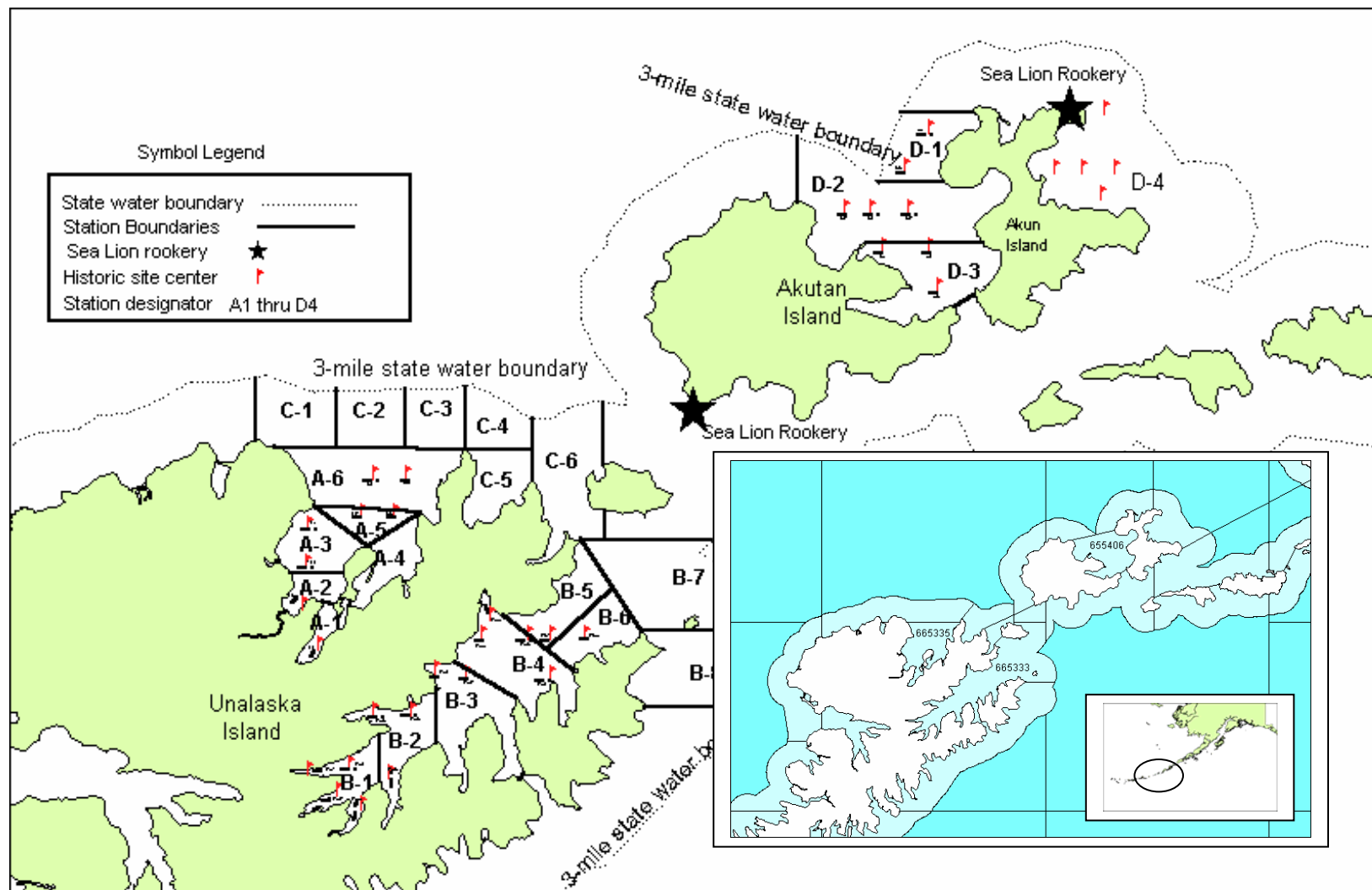
<sup>d</sup> Egg development, '0' = no eggs, '1' = uneyed eggs, '2' = eyed eggs.

<sup>e</sup> Percent of clutch fullness.

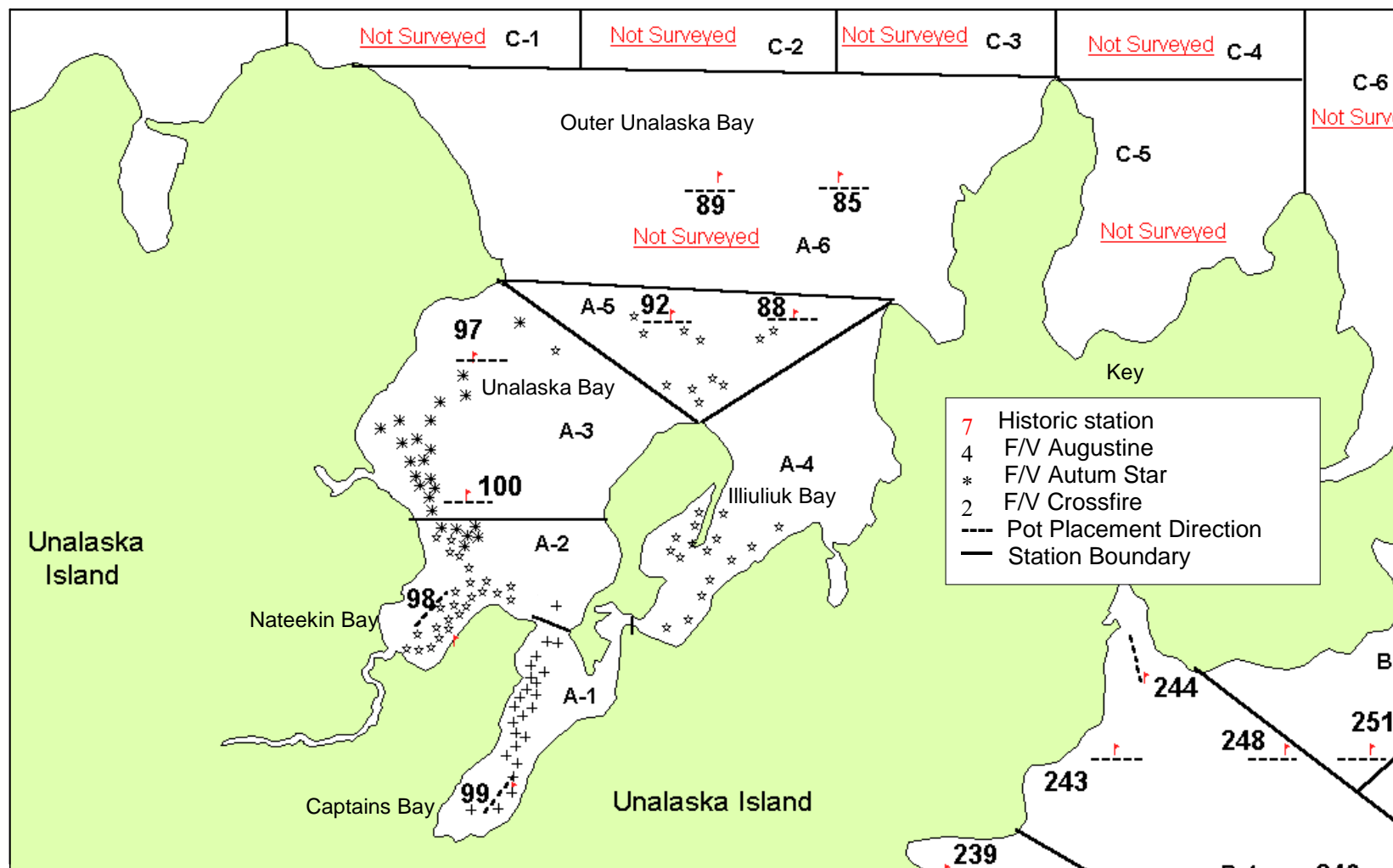
**Table 8.-**2003 Eastern Aleutian District Tanner crab pot survey catch by survey station.

Survey Area	Station	Pots Lifted <sup>a</sup>	Legal	Sublegal	Female	Legal CPUE	Bays Fished
Unalaska Bay	A1	23	750	499	17	33	Captains Bay
	A2	32	3,776	3,269	234	118	Nateekin Bay
	A3	19	685	477	5	36	Broad, Wide Bays
	A4	16	53	264	1	3	Iliuliuk Harbor
	A5	11	0	7	0	0	Unalaska Bay
	Total	101	5,264	4,516	257	52	
Beaver Inlet	B1	20	0	599	86	0	Erskine, Kisselen, Final Bays
	B2	23	0	138	1	0	Unitali, Tanaskan Bays
	B3	6	0	3	2	0	Ugadaga Bay
	B4	12	6	176	35	<1	Agamgik Bay
	B5	1	0	12	3	0	
	B6	1	0	7	2	0	
	Total	63	6	935	129	<1	
Akutan/Akun	D1		Not Surveyed			0	
	D2	15	83	79	0	6	Akutan Bay
	D3	24	1,319	725	0	69	Akutan Harbor
	D4		Not Surveyed			0	
	Total	39	1,402	804	0	36	
Total		203	6,672	6,255	386		

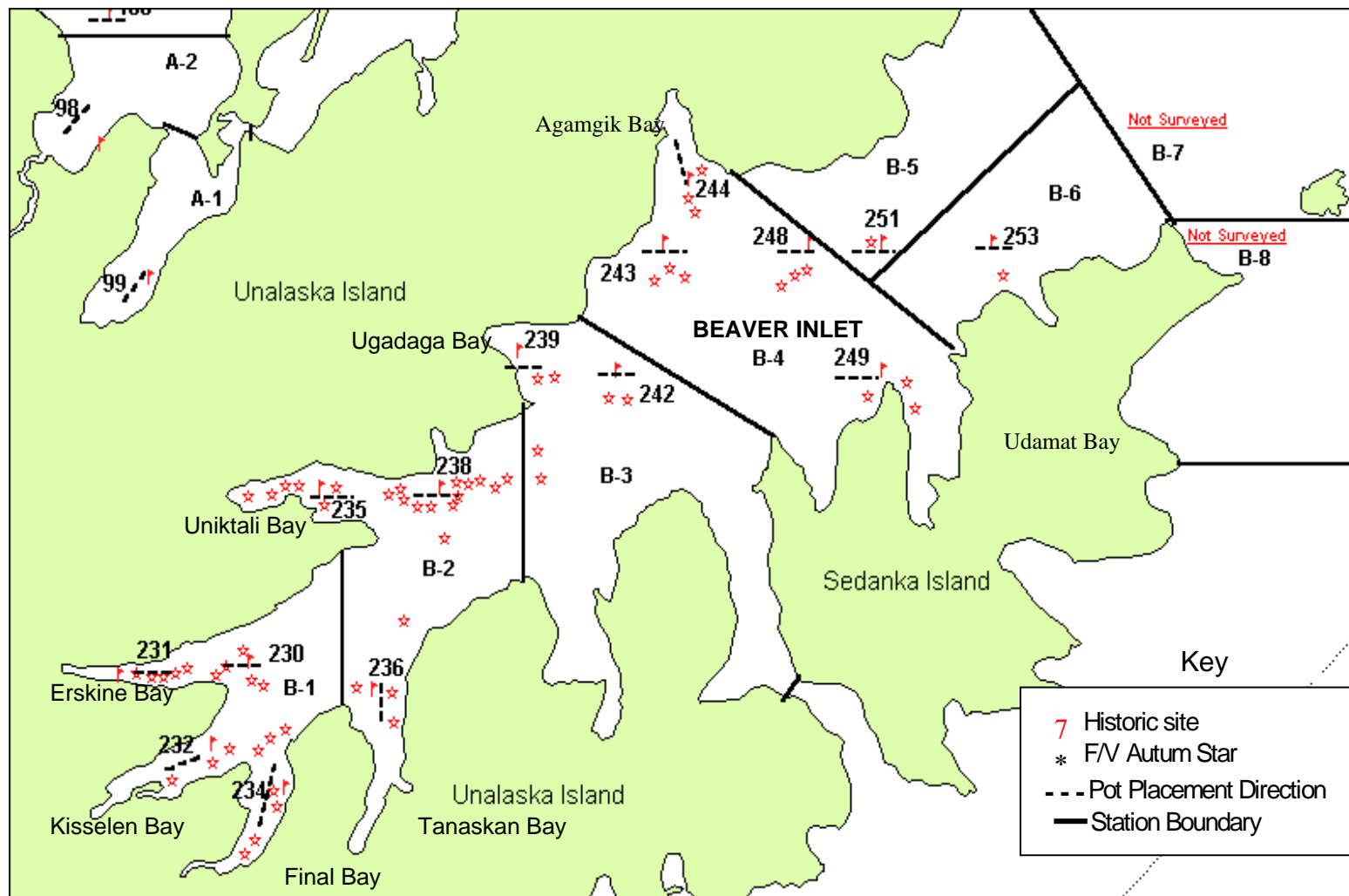
<sup>a</sup> Pots that were improperly set by survey participants in bordering stations were documented with MapInfo 5.5 windows based mapping program. Pots and catch for that station were reassigned to the station the pot was placed in.



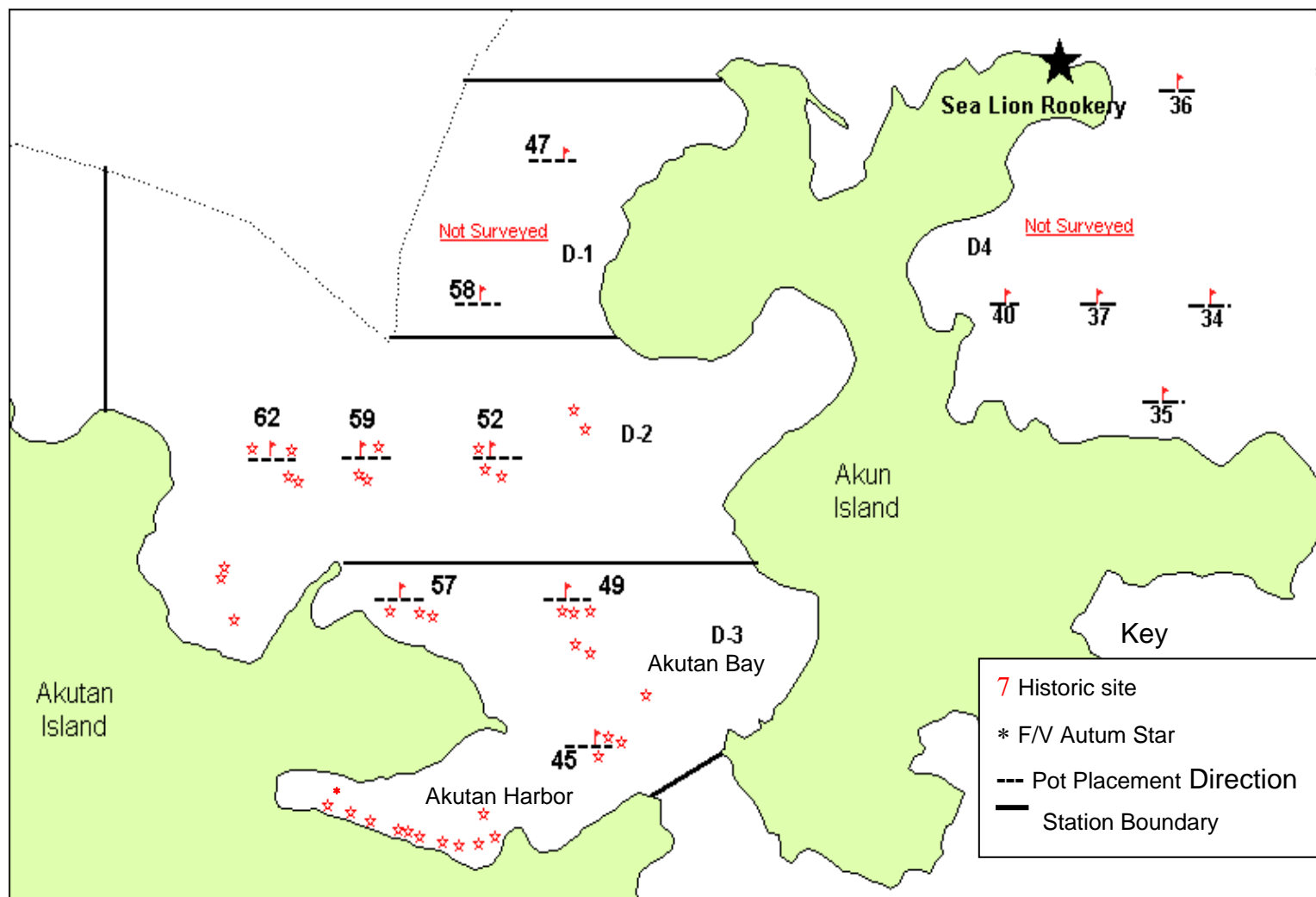
**Figure 1.-**Area of Eastern Aleutian District surveyed in 2003 and corresponding ADF&G statistical areas.



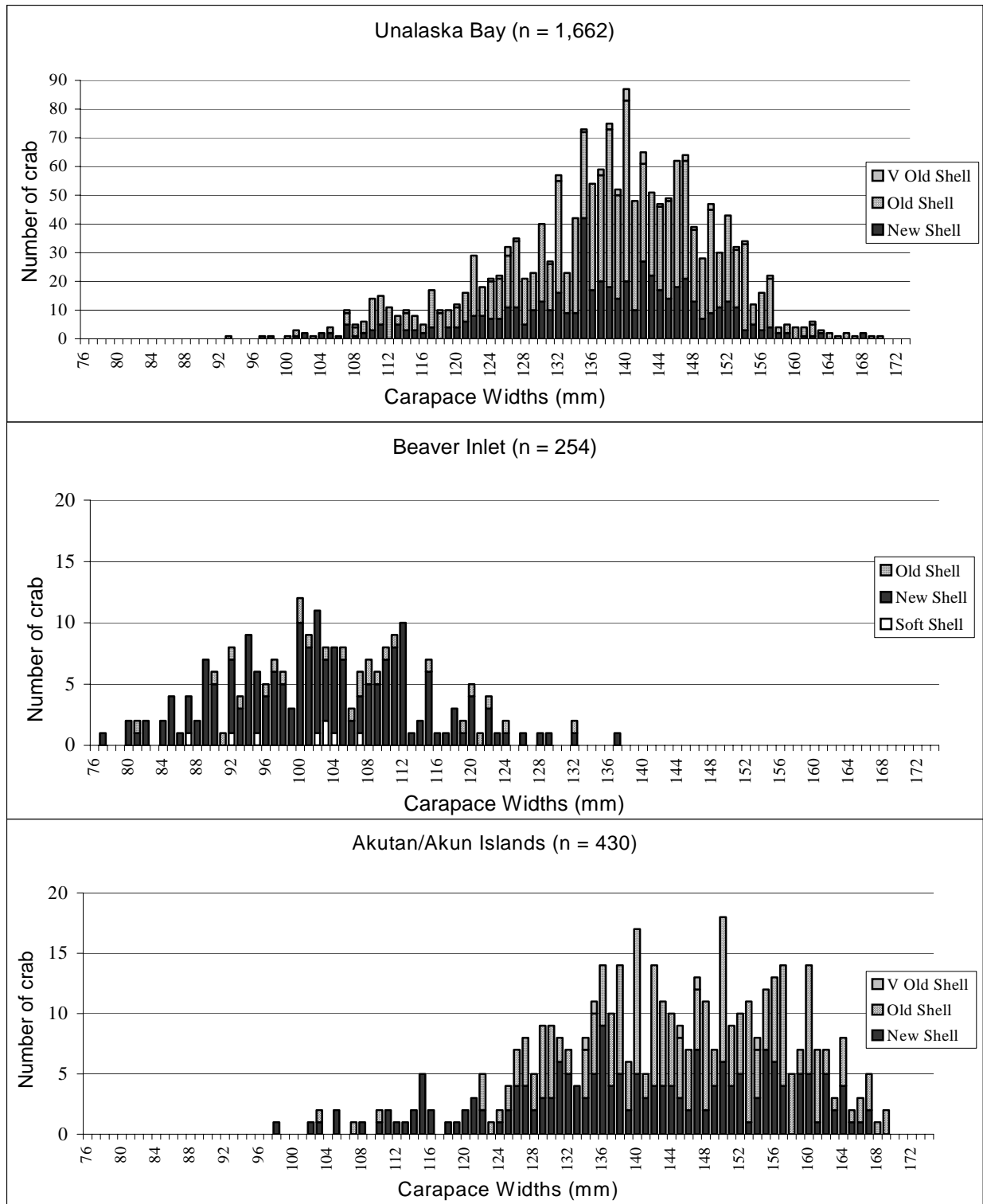
**Figure 2.-**Unalaska Bay pot locations for 2003 Eastern Aleutian District Tanner crab pot survey.



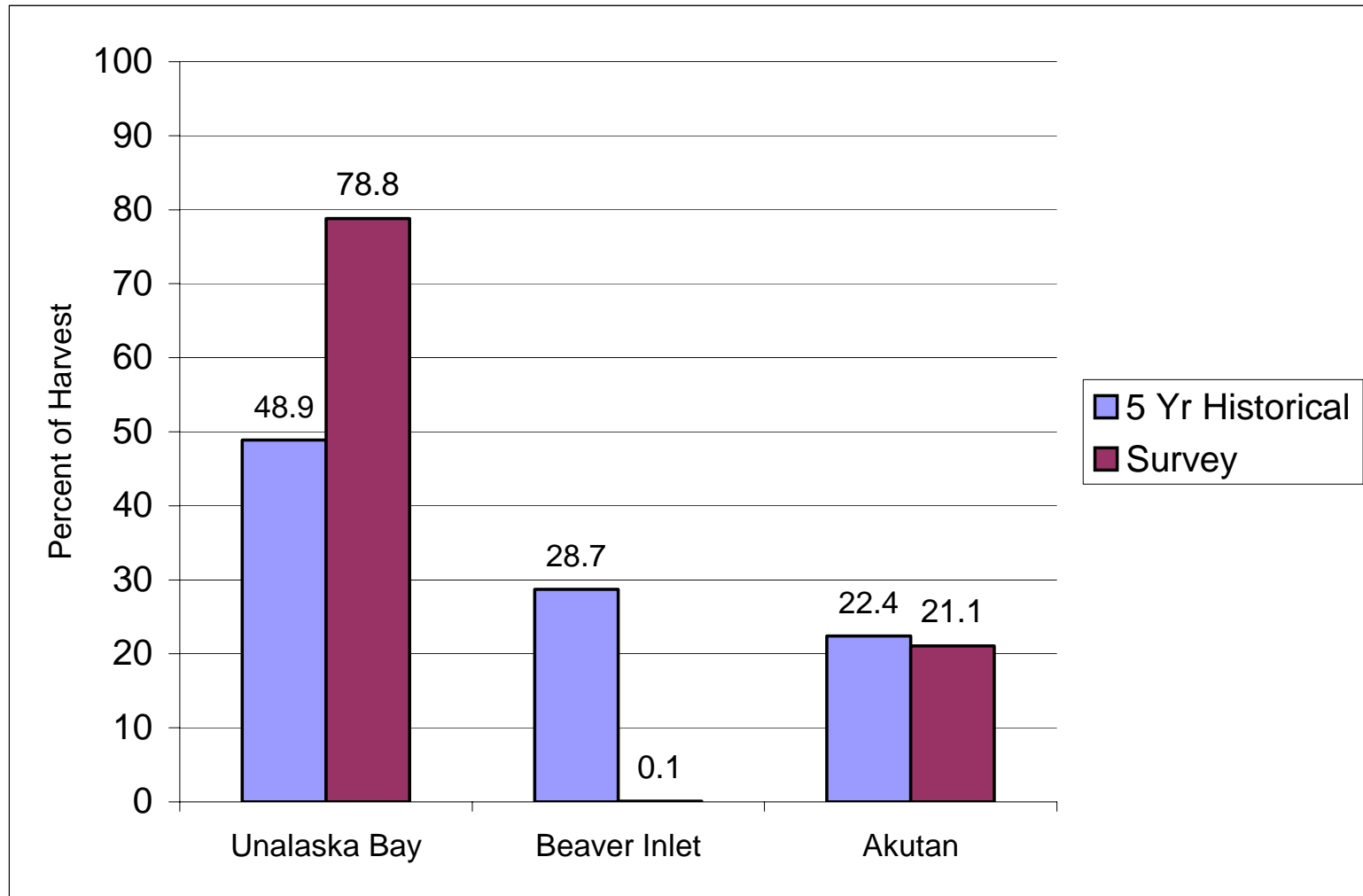
**Figure 3.-**Beaver Inlet pot locations for 2003 Eastern Aleutian District Tanner crab pot survey.



**Figure 4.**-Akutan/Akun Islands area pot locations for 2003 Eastern Aleutian District Tanner crab pot survey.



**Figure 5.-Size frequency and shell-age for male Tanner crabs caught and sampled in Unalaska Bay, Beaver Inlet and Akutan/Akun Islands survey stations during the 2003 Eastern Aleutian District Tanner crab commissioner's permit pot survey.**



**Figure 6.**—Percent of 1990-1994 commercial Tanner crab harvest and 2003 pot survey catches from Unalaska Bay, Beaver Inlet and Akutan.



## **APPENDIX A. LOGBOOK INFORMATION**

**Appendix A1.-**Logbook information from participating vessels.

Station		A1								
Date Set		1/24/2003								
Date Pulled		1/30/2003								
Set Gear					Pulled Gear					Comment
Time Set	Depth (fms)	Bouy (ID)	N. Latitude	E. Latitude	Time Pulled	Soak Time Hours	Legal Males	Sublegal Males	Females	
*	*	*	525303	1663440	*	*	54	22	0	
*	*	*	535217	1663442	*	*	40	17	1	
*	*	*	535207	1663435	*	*	56	27	4	
*	*	*	535056	1663529	*	*	43	33	0	
*	*	*	535132	1663507	*	*	15	22	0	
*	*	*	535048	1663524	*	*	6	15	0	
*	*	*	535108	1663518	*	*	19	23	0	
*	*	*	535208	1663443	*	*	46	22	2	
*	*	*	532929	1663438	*	*	35	10	0	
*	*	*	533231	1663431	*	*	46	6	0	
*	*	*	535157	1663447	*	*	41	32	1	
*	*	*	*	*	*	*	16	28	0	
*	*	*	*	*	*	*	31	26	0	
*	*	46	*	*	*	*	11	50	0	
*	*	86	535022	1663530	*	*	12	45	0	
*	*	95	535100	1663524	*	*	21	35	0	
*	*	*	535110	1663507	*	*	31	8	1	
*	*	38	535254 <sup>a</sup>	1663420	*	*	38	12	5	
*	*	*	*	*	*	*	36	12	0	
*	*	*	*	*	*	*	19	0	0	
*	*	*	*	*	*	*	41	9	0	
*	*	*	*	*	*	*	52	28	2	
*	*	*	*	*	*	*	92	36	1	
*	*	*	*	*	*	*	3	3	0	
Average							34	20	1	

\* Logbook was incomplete.

-continued-

Appendix A1.-Page 2 of 8.

Station		A2								
Date Set		1/15/03 & 1/17/03								
Date Pulled		1/17/03 & 1/19/03								
Set Gear					Pulled Gear					
Time Set	Depth (fms)	Bouy (ID)	N. Latitude	E. Latitude	Time Pulled	Soak Time Hours	Legal Males	Sublegal Males	Females	Comment
1000	50	B4	535337	1663530	1100	49	84	86	0	Sample Pot
1015	45	G-	535267	1663659	1150	50	210	72	0	Historical station
1030	44	H\$	535328	1663586	1235	50	106	166	0	
1045	34	Kim	535319	1663504	1310	51	54	74	0	
1100	50	41	535386	1663633	1345	51	195	177	53	Sample Pot
1115	44	Q6	535263	1663686	1425	51	175	87	0	Historical station
1130	37	Wag	525256	1663735	1455	51	204	115	0	
1145	44	24	535270	1663716	1520	52	198	139	4	
1200	56	Fut	535287	1663682	1610	52	214	156	41	
1215	33	OJ	535365	1663668	1645	52	170	162	43	Sample Pot
1230	43	300	535328	1663626	1720	53	174	174	14	
1245	40	11	535260	1663733	1755	53	138	94	2	Historical station
1300	31	281	535296	1663649	1820	53	126	111	0	
1315	45	PJ	535327	1663668	1850	54	54	38	0	
1330	45	4W	535328	1663556	1920	54	4	5	0	Sample Pot
1345	51	HZ	535281	1663694	1955	54	211	136	1	
1400	56	B4	535407	1663625	1600	26	71	162	43	
1450	50	G-	535419	1663652	1630	26	14	32	0	
1535	45	H\$	535371	1663630	1650	25	154	167	18	
1610	53	Kim	535336	1663638	1720	25	174	196	0	
1645	48	41	535379	1663586	1800	26	89	68	0	Sample Pot
1725	45	Q6	535350	1663610	1830	25	68	146	1	
1755	51	Wag	535259	1663695	1900	25	121	57	0	
1820	61	24	535302	1663639	1930	25	175	69	0	
1910	54	11	535350	1663620	2000	25	141	107	2	
Average	46					42	133	112	9	

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Appendix A1.-Page 3 of 8.

Station		A3								
Date Set		1/17/03 & 1/30/03								
Date Pulled		1/26/03 & 2/1/03								
Set Gear					Pulled Gear					
Time Set	Depth (fms)	Bouy (ID)	N. Latitude	E. Latitude	Time Pulled	Soak Time Hours	Legal Males	Sublegal Males	Females	Comment
1100	55	1	535459	1663635	1330	219	39	43	0	Sample Pot
1130	57	8	535400	1663645	1315	219	107	126	1	
1200	52	42	535418	1663642	1300	217	72	91	0	
1255	25	217	535698	1663506	1030	214	36	43	0	
1330	52	85	5356135	1663684	1100	213	0	0	0	1 Irsh lrd Sample pot, gap in panel
1400	58	135	535627	1663705	1100	213	0	0	0	
1450	42	91	535558	1663775	1140	213	43	30	0	
1505	48	80	535584	1663237	1130	212	41	45	1	Sample Pot 35 snails
1605	51	98	535583	1663724	1115	211	8	0	0	
1620	45	302	535559	1663778	1230	212	0	0	0	
1715	29	81	535521	1663765	1210	211	98	40	0	2-Oct
1730	65	30	535648	1663675	1045	209	18	24	0	
1500	29	30	535526	1663772	1100	44	38	30	0	
1515	29	217	535534	1663777	1015	43	43	27	0	
1545	31	85	535523	1663760	1200	45	40	33	0	
1550	32	135	535520	1663755	1215	45	41	26	0	
1630	58	80	535418	1663646	1330	45	61	65	0	
1635	53	98	535423	1663652	1255	44	50	69	1	
1645	56	8	535424	1663646	1315	45	14	19	0	
1650	53	1	535428	1663655	1240	44	19	39	0	Sample Pot
1700	52	42	535438	1663642	1230	43	26	28	0	
1725	31	302	535528	1663768	1155	42	29	15	0	
1730	30	71	535528	1663771	1130	42	14	19	0	
1750	30	91	535523	1663766	1145	42	17	14	0	Sample Pot
Average	44					129	36	34	0	

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Appendix A1.-Page 4 of 8.

Station		A4								
Date Set		2/3/03 & 2/5/03								
Date Pulled		2/5/03 & 2/9/03								
Set Gear					Pulled Gear					
Time Set	Depth (fms)	Bouy (ID)	N. Latitude	E. Latitude	Time Pulled	Soak Time Hours	Legal Males	Sublegal Males	Females	Comment
1900	17	4\$	535378	1663080	1330	42	17	63	0	set 2/3 pulled 2/5
1910	17	PJ	535392	1663056	1250	42	5	10	0	set 2/3 pulled 2/5
1920	18	X2	535411	1663031	1240	41	10	46	0	set 2/3 pulled 2/5
1940	18	303	535348	1663097	1400	43	4	9	0	set 2/3 pulled 2/5
2000	16	300	535318	1663074	1215	40	0	2	0	set 2/3 pulled 2/5
2010	17	Kim	535297	1663090	1200	40	0	1	0	set 2/3 pulled 2/5
2015	16	Wag	535276	1663109	1130	39	0	1	0	set 2/3 pulled 2/5
2020	16	G=	535261	1663133	1100	39	0	1	0	set 2/3 pulled 2/5
1120	18	G=	535388	1662993	1120	96	5	25	0	set 2/5 pulled 2/9
1150	17	Wag	535371	1663021	1150	96	4	23	0	set 2/5 pulled 2/9
1200	17	Kim	535357	1663034	1215	96	2	29	0	set 2/5 pulled 2/9
1230	17	300	535337	1663054	1300	97	0	6	0	set 2/5 pulled 2/9
1250	17	X2	535396	1663004	1320	98	3	14	0	set 2/5 pulled 2/9
1320	16	PJ	535389	1663194	1355	96	0	3	0	set 2/5 pulled 2/9
1400	16	H\$	535373	1663188	1420	96	1	16	1	set 2/5 pulled 2/9
1411	16	303	535417	1663076	1510	97	2	15	0	set 2/5 pulled 2/9
Average	17					69	3	17	0	

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Appendix A1.-Page 5 of 8.

Station		A5								
Date Set		1/15/03 & 1/17/03								
Date Pulled		1/17/03 & 1/18/03								
Set Gear					Pulled Gear					Comment
Time Set	Depth (fms)	Bouy (ID)	N. Latitude	E. Latitude	Time Pulled	Soak Time Hours	Legal Males	Sublegal Males	Females	
1230	60	pink	535701	1663154	800	19	0	0	0	
1240	70	x2	535719	1663118	820	20	0	0	0	
1300	70	butt	535719	1663073	840	20	0	0	0	
1315	30	hole	535707	1662786 <sup>d</sup>			Lost Pot			
1335	35	f47	535704	1662822 <sup>d</sup>			Lost Pot			
1350	40	303	535711	1662856	1100	22	0	0	5	
1405	50		535653	1663248	1115	21	0	0	0	
1425	50		535640	1663286	1140	21	0	0	0	
925	60	pink	535694	1663448	1440	29	0	0	0	
930	45	x2	535684	1663213	1425	29	0	0	0	
950	70	butt	535682	1663274	1419	29	0	0	0	
1010	30	hole	535666	1663113	1400	28	0	0	0	
1020	50	f47	535650	1663093	1335	27	0	1	0	
1030	50	303	535630	1663052 <sup>c</sup>	1300	27	0	1	0	
Average	51					24	0	0	0	

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Appendix A1.-Page 6 of 8.

Station	B4									
Date Set	1/24/2003									
Date Pulled	1/25/2003									
Set Gear					Pulled Gear					
Time Set	Depth (fms)	Bouy (ID)	N. Latitude	E. Latitude <sup>g</sup>	Time Pulled	Soak Time	Legal	Sublegal		Comment
						Hours	Males	Males	Females	
2100	62	Kim	535077	1662124	2000	23	0	0	0	Historical site 243
2120	45	HZ	535097	1662098	2030	23	0	0	0	Historical site 243
2140	110	8B	534759	1662434	2050	23	0	12	0	Historical site 243
2210	160	H\$	535069	1661780	2100	23	1	0	0	Historical site 248
2220	138	41	535087	1661739	2130	23	1	40	0	Historical site 248
2240	90	G=	535098	1661705	100	26	3	42	0	Historical site 248
2100	100	G=	535098	1661198 <sup>e</sup>	2209	25	2	1	0	Station B6
2120	104	41	535181	1661499 <sup>e</sup>	2225	25	0	22	0	Station B5
2140	40	HZ	534926	1661500	2250	25	0	12	0	Historical site 249
2210	38	H\$	534902	1661497	2300	25	0	0	0	Historical site 249
2220	60	Kim	534892	1661539	2315	25	0	2	7	Historical site 249
100	40	PJ	535175	1662021	2330	46	0	1	0	Historical site 244
120	40	Fut	535202	1662038	10	23	0	22	0	Historical site 244
140	40	X2	535223	1662044	30	23	0	0	0	Historical site 244
10	30	X2	534927	1662449	2240	26	0	3	2	Station B3, Hist.site 239
35	30	Fut	534930	1662498 <sup>f</sup>	2250	25	0	10	0	Station B3, Hist.site 239
110	126	PJ	534905	1662267 <sup>f</sup>	2330	24	0	0	0	Station B3, Hist.site 242
120	140	8B	534900	1662223 <sup>f</sup>	2350	23	0	11	1	Station B3, Hist.site 242
Average	77					25	0	10	1	

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Appendix A1.-Page 7 of 8.

Station	D2									
Date Set	1/27/03									
Date Pulled	1/31/03									
Set Gear					Pulled Gear					
Time Set	Depth (fms)	Bouy (ID)	N. Latitude	E. Latitude	Time Pulled	Soak Time Hours	Legal Males	Sublegal Males	Females	Comment
1915	48	303	541268	1654979	715	84	0	0	0	Hist. site 62, pull 1/31
1910	46	300	541247	1654954	649	84	0	0	0	Hist. site 62, pull 1/31
1850	43	Wag	541217	1654929	625	84	0	0	0	Hist. site 62, pull 1/31
1740	43	HZ	541220	1654717	545	84	0	0	0	Hist. Site 59, pull 1/31
1730	42	41	541242	1654742	510	84	0	0	0	Hist. site 59, pull 1/31
1726	41	11	541267	1654723	445	83	0	0	0	Hist. site 59, pull 1/31
1640	52	24	541220	1654382	205	82	0	0	0	Hist. site 52, pull 1/31
1640	52	4W	541241	1654414	140	33	1	1	0	stn52(2) set 1/29 pull 1/31
1700	52	OJ	541264	1654434	120	32	0	0	0	stn52(2) set 1/29 pull 1/31
1730	47	H\$	541284	1655004	815	39	1	0	0	stn52(2) set 1/29 pull 1/31
1300	44	Fut	541339	1654255	100	12	2	7	0	Set 1/30 Pull 1/31
1310	47		541312	1654249	40	11	23	25	0	Set 1/30 Pull 1/31
1600	27	Pj	541121	1655085	730	15	43	2	0	Set 1/30 Pull 1/31
1610	26	X2	541099	1655091	745	15	3	29	0	Set 1/30 Pull 1/31
1620	24	Kim	541070	1655082	800	16	10	15	0	Set 1/30 Pull 1/31
Average	42					51	6	5	0	

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Appendix A1.-Page 8 of 8.

Station	D3										
Date Set	1/24/03										
Date Pulled	1/27/03										
Set Gear					Pulled Gear						
Time Set	Depth (fms)	Bouy (ID)	N. Latitude	E. Latitude	Time Pulled	Soak Time Hours	Legal Males	Sublegal Males	Females	Comment	
1130	35	11	540883	1654194	1020	23	82	41	0	Historical site 45	
1140	34	4W	540848	1654154	1040	23	104	34	0	Historical site 45	
1149	33	24	540862	1654119	1120	24	88	44	0	Historical site 45	
1230	27	303	541048	1654644	1800	30	0	1	0	Historical site 57	
1241	27	300	541042	1651019	1810	30	0	0	0	Hist. site 57, Pull 1/29	
1300	31	Wag	241059	1654542	1820	125	0	0	0	Hist. site 57, Pull 1/29	
1310	50	Q6	541048	1654266	1300	96	44	18	0	Hist. site 49, Pull 1/27	
1315	50	OJ	541048	1654225	1240	95	20	17	0	Hist. site 49, Pull 1/27	
1330	46	Pink	541046	1654183	1200	95	15	4	0	Hist. site 49, Pull 1/27	
700	27	G=	540765	1654763	1348	55	137	37	0	Set 1/27 pull1/29	
715	27	41	540758	1654724	1325	54	167	39	0	Set 1/27 pull1/29	
720	27	HZ	540751	1654686	1310	54	60	25	0	Set 1/27 pull1/29	
730	30	H\$	540745	1654646	1248	53	90	123	0	Set 1/27 pull1/29	
735	27	8B	540737	1654605	1238	53	59	24	0	Set 1/27 pull1/29	
740	27	Kim	540731	1654565	1225	53	31	19	0	Set 1/27 pull1/29	
745	25	PJ	540728	1654523	1215	53	36	6	0	Set 1/27 pull1/29	
750	30	X2	540732	1654479	1200	53	54	22	0	Set 1/27 pull1/29	
800	30	Fut	540736	1654406	1148	52	52	27	0	Set 1/27 pull1/29	
1115	35	4W	540886	1654119	1540	52	116	38	0	Set 1/27 pull1/29	
1142	28	24	540911	1654099	1600	53	5	6	0	Set 1/27 pull1/29	
1226	45	Pink	540962	1654212	1100	71	31	29	0	Set 1/27 pull1/30	
1401	33	Q6	540801	1654388	LOST	POT			0	Set 1/27 pull1/29	
1410	35	OJ	540794	1654437	1445	48	35	36	0	Set 1/27 pull1/29	
1431	26	11	540790	1654505	1420	48	47	61	0	Set 1/27 pull1/29	
1400	25	G=	540777	1654807	400	62	42	40	0	Set 1/29 pull1/31	
Average	32					56	55	29	0		

\* Logbook was incomplete.

<sup>a</sup> Pot set in violation of permit, set in station A2.

<sup>b</sup> Pots in violation of permit, set in station A2.

<sup>c</sup> Pot set in violation of permit, set in station A3.

<sup>d</sup> Pot lost, not counted as pot lifted.

<sup>e</sup> Historic survey sites located in stations B5 and B6.

<sup>f</sup> Historic survey sites in station B3 not assigned to survey participants. Asked by staff observer onboard to survey.

<sup>g</sup> Logbook pages for survey stations B1, B2 were lost in damaged laptop computer during the trip.



**APPENDIX B. COMMISSIONER'S PERMIT FOR THE 2003  
EASTERN ALEUTIAN TANNER CRAB POT SURVEY**

**Appendix B1.-Commissioner's permit for the 2003 Eastern Aleutian Tanner crab pot survey.**

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ALASKA DEPARTMENT OF FISH AND GAME  
EASTERN ALEUTIAN ISLANDS TANNER CRAB COMMISSIONER'S PERMIT  
UNALASKA AND AKUTAN ISLANDS, JANUARY-FEBRUARY 2003

VESSEL NAME: \_\_\_\_\_ ADF&G # \_\_\_\_\_

OPERATOR: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY, STATE, ZIP CODE \_\_\_\_\_

IN ADDITION TO CURRENT TANNER CRAB COMMERCIAL FISHING REGULATIONS,  
PARTICIPANTS AGREE TO THE FOLLOWING CONDITIONS:

- 1) Permit is valid from NOON January 15, to NOON February 15, 2003.
- 2) Participants may only fish for Tanner crabs in those locales and stations randomly assigned by ADF&G. In Unalaska Bay, overall vessel length is restricted to a maximum of 58' (see 5 AAC 35.590. VESSEL LENGTH RESTRICTIONS).
- 3) Twenty-five pots are to be fished in each station. Pots may not be reset within a station. Only single pots will be allowed, no longlined pots may be used. Pots will be soaked a minimum of 24 hours and a maximum of 48 hours. Pots will be spaced by at least 1/4 nautical mile. In stations containing historic pot survey sites, three pots must be set along each historic survey line. The remaining compliment of the pots in each station may be fished at locations determined by the vessel operator.
- 4) A vessel may use no more than two pot sizes. If a vessel has pots of two sizes, the pot types must be fished randomly within a station. The minimum pot size is a 5' by 5' square pot.
- 5) Pots must be square pot Tanner crab gear (minimum 5'x 5'), however, no more than two opposing tunnel entrances per pot are allowed. Pots may not contain mesh larger than 5-inch stretch mesh. Escape rings must be covered so that all escape ring openings have a maximum diameter of 3.5 inches.
- 6) Each vessel operator will record location of pots fished, catch, depth and soak time in a logbook supplied by ADF&G. Logbook data will be made available to ADF&G on request and completed logbooks will be returned to ADF&G on completion of the survey.
- 7) Participants must report to ADF&G the number of pot lifts and number of legal and sublegal male and female crab from each station completed prior to moving to the next station.

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- 8) The department will place a staff member on board the vessel to collect biological data on the non-retained portion of the catch and to document fishing practices. Vessel operators are required to coordinate fishing activity with the availability of the Dutch Harbor staff.
- 9) Participants will notify ADF&G in Dutch Harbor prior to commencement of gear operation and at the conclusion of gear operation. Participants must notify ADF&G in Dutch Harbor prior to offloading and the offload must be conducted in such a manner that biological data can be collected from the retained portion of the catch.
- 10) Vessels must adhere to commercial landing requirements at the close of the survey, or when all stations are completed.
- 11) Vessels are expected to survey all assigned stations. Failure to complete all assigned stations may result in the cancellation of this permit.

Stations Assigned: \_\_\_\_\_

\_\_\_\_\_  
ADF&G REPRESENTATIVE

\_\_\_\_\_  
DATE ISSUED

**I, \_\_\_\_\_, operator of the F/V \_\_\_\_\_, hereby authorize the release of confidential fish ticket harvest information that results from my participation in the January-February 2003 eastern Aleutian Islands Tanner crab survey. I understand this information will be used for reporting of stock condition of Tanner crab in the eastern Aleutian Islands. I also agree to abide by all permit terms stated above.**

\_\_\_\_\_  
VESSEL OPERATOR

\_\_\_\_\_  
INTERIM USE PERMIT